

CLAIMS

Please cancel claims 16-37 without prejudice.

1. (Original) A method for treating a surface of a quartz substrate comprising:
preparing a quartz substrate to provide a working surface having an initial working surface roughness; and
ultrasonically acid-etching said working surface to increase the roughness of said working surface by at least about 10%.

2. (Original) A method for treating a surface of a quartz substrate as recited in claim 1 wherein preparing a quartz substrate includes obtaining a quartz substrate having an initial working surface roughness greater than about 10 Ra.

3. (Original) A method for treating a surface of a quartz substrate as recited in claim 2 wherein preparing a quartz substrate includes obtaining a quartz substrate having an initial working surface roughness of about 16 Ra.

4. (Original) A method for treating a surface of a quartz substrate as recited in claim 2 wherein preparing a quartz substrate includes roughening said initial working surface to a roughness greater than about 100 Ra by coarse grit blasting said working surface with a grit having mesh size no greater than about 100.

5. (Original) A method for treating a surface of a quartz substrate as recited in claim 4 wherein said roughening roughens said initial working surface to a roughness greater than about 300 Ra.

6. (Original) A method for treating a surface of a quartz substrate as recited in claim 1 wherein ultrasonically acid-etching increases the working surface roughness by at least about 25%.

7. (Original) A method for treating a surface of a quartz substrate as recited in claim 1 wherein ultrasonically acid-etching increases said working surface roughness by at least about 50%.

8. (Original) A method for treating a surface of a quartz substrate as recited in claim 1 further comprising:

grit blasting said working surface after ultrasonically acid-etching said working surface with a fine grit having a mesh size greater than about 100.

9. (Original) A method for treating a surface of a quartz substrate as recited in claim 8 wherein said fine grit has a mesh size greater than about 200.

10. (Original) A method for treating a surface of a quartz substrate as recited in claim 8 wherein said acid-etching is a first acid-etching and further comprising a second acid-etching of said working surface after fine grit blasting said working surface.

11. (Original) A method for treating a surface of a quartz substrate as recited in claim 10 wherein said first acid-etching removes substantially more material from said working surface than said second acid-etching.

12. (Original) A method for treating a surface of a quartz substrate, said method comprising

ultrasonically acid-etching a substrate to substantially remove one or more cracks in a working surface of said substrate, and

subjecting said substrate surface to a final cleaning process which prepares said substrate for use.

13. (Original) A method for treating a surface of a quartz substrate as recited in claim 12 further comprising:

coarse grit blasting said working surface prior to ultrasonically acid-etching to produce a roughened surface having an average surface roughness (Ra) of between about 100 and 400 Ra.

14. (Original) A method for treating a surface of a silicon-containing substrate as recited in claim 12 wherein said final cleaning process comprises:

contacting said substrate with an acidic solution selected from said group consisting of HF:HNO₃:H₂O and HF:H₂O₂:HNO₃;
rinsing said substrate with deionized water;
ultrasonicating said substrate in an ultrasonication deionized water bath;
drying said substrate with nitrogen to remove excess moisture; and
heating said substrate under a heat lamp or in an oven.

15. (Original) A method for treating a surface of a silicon-containing substrate as recited in claim 12 further comprising:

micro-roughening said surface of said substrate prior to said final cleaning process by:
(a) positioning a pressurized grit expulsion nozzle a predetermined distance from, and at an angle less than about 60° to, said substrate surface; and
(b) ejecting grit from said nozzle against said surface at a velocity sufficient to produce a micro-roughened surface.

Claims 16-37 (Canceled).